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## No. XXXV.

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*A Monograph of North American insects, of the genus Cicindela. By Thomas Say.—Read, 7 Nov. 1817.*

IT will perhaps be thought necessary, previous to entering into a technical detail of the characters of the genus *Cicindela*, and of the indigenous individuals which are comprehended by it, that some account of the manners of this sprightly tribe should be given, and of such circumstances, relating to them, as may serve to present them to the recollection of the general observer. I shall accordingly proceed to state, that these insects usually frequent arid, denudated soils; are very agile, run with greater celerity than the majority of the vast order to which they belong; and rise upon the wing, almost with the facility of the common fly. They are always to be seen, during the warm season, in roads or pathways, open to the sun, where the earth is beaten firm and level. At the approach of the traveller, they fly up suddenly to the height of a few feet, pursuing then a horizontal course, and alighting again at a short distance in advance, as suddenly as they arose. The same individual may be roused again and again, but when he perceives himself the object of a particular pursuit, he evades the danger by a distant and circuitous flight, usually directed towards his original station. It is worthy of observation, as a peculiarity common to the species, that when they alight, after having been driven from

their previous position, they usually perform an evolution in the air near the earth, so as to bring the head in the direction of the advancing danger, in order to be the more certainly warned of its too near approach.

They lead a predatory life, and as it would appear, are well adapted to it, by their swiftness, and powerful weapons of attack. The beaten path, or open sandy plain, is preferred, that the operations of the insects may not be impeded by the stems and leaves of vegetables, through which, owing to their elongated feet, they pass with evident difficulty and embarrassment. They prey voraciously upon the smaller and weaker insects, upon larvæ and worms, preferring those whose bodies are furnished with a membranaceous cuticle, more readily permeable to their *instrumenta cibaria*.

The same rapacity is observable in the larva, or imperfect stage of existence, of these insects, that we have occasion to remark in the parent ; but not having been endowed by nature with the same light and active frame of body, they are under the necessity of resorting to stratagem and ambuscade for the acquisition of the prey, which is denied to their sluggish gait. The remark is, I believe, generally correct, though liable to many signal exceptions, that carnivorous animals display more cunning, industry, and intelligence, than those whose food is herbs, for the acquisition of which, fewer of the mental attributes are requisite ; we see throughout the animated creation, that the developement of these qualities, as well as of the corporeal functions, are in exact correspondence with their necessities ; and that where a portion of the one is withheld, an additional proportion of the other is imparted. This larva has a very large head, elongated abdomen, and six short feet placed near the head ; when walking, the body rests upon the earth, and is dragged forward slowly by the feet. Notwithstanding these disadvantages they contrive means to administer plentifully to an appetite, sharpened by a rapid increase of size. A cylindrical hole is dug in the ground to a considerable depth, by means of the feet and mandibles, and the earth transported from it, on the concave surface of the head ; this cell is en-

larged and deepened, as the inhabitant increases in size, so that its diameter is always nearly equal to that of the head. At the surface of the earth they lay in wait for their prey, nicely closing the orifice of the hole by the depressed head, that the plain may appear uninterrupted; when an incautious or unsuspecting insect approaches sufficiently near, it is seized by a sudden effort of the larva, and hurried to the bottom of the dwelling, to be devoured at leisure. These holes we sometimes remark, dug in a footpath; they draw the eye by the motion of the inhabitant retreating from the surface, alarmed at the approach of danger.

I shall now proceed to offer some remarks on the affinities of this genus, and endeavour to point out the differential traits, by which it may be distinguished from its congeners. *Cicindela*, according to Linnæus, included not only all the insects, which would at this day be referred to it, but many others, which, however closely allied by habit, are widely distinct in the formation of their oral organs. These were separated by the celebrated systematists, Fabricius and Latreille, into several new genera, to which well defined essential characters have been affixed. These separations have been made upon the best possible grounds; the convenience of the student, and the approximation to natural method. So circumscribed, *Cicindela* presents a natural group, in which each individual so perfectly corresponds with the others, as well in its internal organization and parts of the mouth, as in habit, or general form of the body, that the entomologist finds no difficulty in distinguishing it from insects of neighbouring genera, and referring it to its relative situation.

The genera to which allusion is here made, as having affinity with the one under consideration, are principally *Colliuris*, *Therates*, *Megacephala*, *Manticora*, *Elaphrus*, and *Nothophilus*. In constructing the essential character, I have endeavoured to ascertain such traits as will at once, invariably, distinguish *Cicindela* from all other known genera of the Pentamerous Coleoptera, and prevent the occurrence of error in the reference of species to it. In external form, *Cicindela*

borders very closely upon the genera here enumerated, and in addition to evidence of frequent recurrence, furnishes us with ample proof, that if habit was the only character consulted in the formation of a system, animals of very different modes of life, and totally distinct in nature, would be blended together by artificial violence. Of the genera above mentioned, the two last are very distinct from *Cicindela*, by the inarticulated maxillary nail, and by a deep sinus on the inner edge of the anterior tibia, characters which at once approach them to the *Carabi*, notwithstanding the almost perfect similarity which *Elaphrus* bears to *Cicindela* in miniature, by the form and proportions of its body. The mentum or chin also of the former, is not divided as it is in the latter genus, and it is worthy of particular remark, that in *Nothiophilus* there exists the spine and recipient cavity of *Elater*. *Colliuris* is composed of two species, natives of the East Indies, and one of South America, distinguished by the cylindrically-conic thorax, more elongated body, and narrow, transverse mentum, which is widely emarginated, without a conspicuous inner division, but in other respects much resembling *Cicindela*. A genus has been lately formed by Mr. Latreille, under the name of *Therates*, for an insect of the South Sea Islands, which Fabricius had named *C. labiata*. This has a strikingly discrepant peculiarity in the form of the intermediate palpi, which are abbreviated into a spine-like process. *Manticora* includes two species, indigenous to the Cape of Good Hope, which resemble *Cicindela* by the form of the mentum, in which there is scarcely any difference; the jaws also are similar, and the mandibles not unlike; but a good distinctive character rests in the palpi, of which the posterior are larger than the intermediate ones; the abdomen also is somewhat pedunculated, and embraced each side by the elytra. The last proximate genus which I shall notice, is that of *Megacephala*, of which at least two species, the *Carolina* and *Virginica*, are natives of this country, and are principally found in the southern states. In this genus, as in those before adverted to, there is no difficulty in pointing out good and substantial characters, by which

it may be readily known; the anterior palpi are elongated, and reflected, not equal to the intermediate ones, as in *Cicindela*; the inner division of the mentum is much shorter and the front of the head convex.

Having thus noted the differences existing between this genus and each of its neighbouring genera, I shall next proceed to lay down its characters, distinguishing them into Essential, Artificial and Natural, for the first of which the preceding remarks will furnish materials; and finally, I shall endeavour to describe the species with such accuracy and detail, that they may be readily known.

## ORDER V.—COLEOPTERA.

*Section I. PENTAMERA.—Family I. ENTOMOPHAGA.—Tribe I. CICINDELETÆ.*

### GENUS CICINDELA.

*Cicindela. Linn. Fabr. Latr.*

*Buprestes. Geoff.*

#### *Essential Character.*

*Maxillæ* monodactyle.

*Mentum* trifid, inner division scarcely shorter.

*Intermediate* and *posterior palpi* subequal, filiform.

*Tibia* simple.

#### *Artificial Character.*

*Antennæ* filiform.

*Clypeus* shorter than the labrum.

*Maxillæ* with two very distinct palpi, of which the exterior one, is nearly equal to the labial palpi, penultimate joint of the latter hairy.

*Mentum* trifid, the divisions nearly equal in length.

*Feet* slender, elongated. *Anterior* tibia without a sinus near the tip.

*Natural Character.*

**BODY** oblong, of a medium size, agile, winged, hairy, above depressed, and punctured.

**HEAD** as large as the thorax, exserted, inclined, suboval.

*Vertex* rugose, elevated each side upon the eyes, concave on the disk.

*Antennæ* filiform, eleven-jointed, shorter than the body, first joint dilated, attenuated at base, and inserted in the anterior canthus of the eye, with which and with the clypeus it is nearly in contact; second joint very small, rounded, third cylindrical, longest, and with the next dilated at tip, succeeding ones subequal, or gradually decreasing in length, and furnished with a few rigid hairs at their tips, terminal one obtuse.

*Clypeus* transverse, very short, contracted in the middle.

*Labrum* coriaceous, very large, transverse, often dentated, exserted, prominent.

*Mandibles* advanced, prominent, attenuated and incurved towards the tip, dentate within, a large compound tooth at the base, and about three other distinct ones nearer the tip.

*Maxillæ* corneus, recurved, linear, a little gibbous at the insertion of the palpi, deeply ciliate with rigid bristles within, and armed with a terminal, distinct, moveable, partly incurved nail.

*Palpi* six, filiform; anterior pair biarticulate, first joint elongated, rectilinear, a little dilated at tip, almost attaining the apex of the maxilla, second joint linear, incurved over the point of the maxilla and attaining the termination of the nail.

*Intermediate palpi* with the preceding, situate on the back of the maxillæ, quadriarticulate, first joint

abbreviated, attenuated at its insertion, second joint cylindric, elongated beyond the tip of the maxilla and equal to the two succeeding ones conjointly, third shorter than the terminal one, gradually dilated to the apex, fourth somewhat enlarged towards the extremity, truncate.

*Posterior*, or *Labial palpi* pedunculated, approximate at base, nearly equal to the preceding pair, triarticulate, first joint minute, attaining the tip of the inner division of the mentum, second elongated, cylindric, very hairy above, terminal one glabrous, half as long as the preceding, truncate at summit.

*Labium* membranaceous, short, concealed behind the mentum.

*Mentum*, corneous, transverse, somewhat concave, trifid, inner division conic, as long or nearly so as the lateral ones, and a little more advanced, lateral ones dilated, and rounded on the external margin, tip conic, the separating sinuses admitting the free motion of the labial palpi.

*Eyes* large, very prominent, reticulate, obovate, distant from the thorax.

TRUNK. *Thorax* subquadrate, length and breadth nearly equal, generally with an anterior and posterior impressed, transverse line connected by a dorsal, longitudinal one giving to the disk a bilobate appearance.

*Scutel* triangular, conspicuous, acutely margined.

*Pectus* hairy, punctured or scabrous, brilliant, prominent between the anterior coxæ, (sternum) about half as long as the coxæ, concave at tip.

*Epigastrium* usually hairy, punctured, brilliant.

*Elytra* rigid, as long as the abdomen, depressed, incumbent not deflected, rounded behind, wider than the thorax, humerus prominent, rounded before, suture and margin nearly parallel, disk punctured, granulated, granulæ exceedingly minute.

*Wings*, hyaline, with a few nerves; costal margin strong, stigma dilated, with three hyaline spots.

*Feet* elongated, sub-compressed, slender, formed for running; hind pair longest; anterior pair shortest; *coxæ* of the four anterior ones conic-ovate, of the posterior pair minute and concealed; *trochanters* of the two anterior pairs subtriangular, of the posterior ones large, reniform and prominent; *thighs* nearly equal to the tibia, two anterior pairs, a little dilated near the base and attenuated towards the tip, hind pair linear; *tibiæ* slender, linear, not emarginate within, heel armed with two spines; *tarsi* five-articulate, filiform, longer than the tibia, joints cylindrical, first joint longest, second, third and fourth gradually decreasing in length, the latter not bilobate, terminal joint as long as the third and furnished with two simple, incurved, acute nails; first, second and third joints of the anterior pairs in the male dilated, hairy beneath.

**ABDOMEN** subcordate or subtriangular, of six distinct segments, five in the female; *tergum* concave on the disk, with an elevated margin; *venter* convex, first segment divided into two remote, almost triangular portions, forming the anterior lateral angles, second segment with two deep, rounded, sinuses near the middle for the reception of the third pair of *coxæ*, separated by a subtriangular, obtuse portion of the segment; third, fourth and fifth subequal, conspicuously falcate behind at the margin, rather diminishing in size, the last more rapidly narrowed in the male, the sixth segment with an obtuse sinus at the middle tip; *tail* convex above, truncate beneath, with a deeply indented line near the tip in the female.

**LARVA.** Body soft, cylindrical, elongated, whitish, with a double, erect, dorsal spine on the eighth segment;

*head* coriaceous, coloured, depressed and concave above, beneath convex, much broader than the body, rounded, furnished with strong, prominent mandibles, short antennæ, and two stemmata on each side; first, second and third segments, each furnished beneath with a pair of scaly feet, the former with a coriaceous disk; *tail* simple.

**FOOD**, insects, worms, &c. in the different stages of their existence.

**SEASON**, spring, summer, autumn.

**COLOUR**, green, purplish or black, often varied with the two former, and exhibiting brilliant metallic tints, the elytra usually with abbreviated bands, lunules and spots of white or yellow.

*Obs.* The sexes may be distinguished from each other by the three first anterior tarsal joints of the male being dilated, and hairy beneath the last segment of the body, with an obtuse sinus. The tarsi of the female are simple, the tail canaliculate towards the tip.

## SPECIES.

### 1. CICINDELA \**Vulgaris*.

C. obscure, on each elytron three whitish bands, two of which are curved, and the intermediate one refracted.

Length more than three-fifths of an inch.

*Inhabits* North America.

**DESCR.** **HEAD** blackish or obscure cupreous, green at base above, front with cinereous hair; *antennæ* first, second, third and fourth joints green, furnished with a few white hairs before, origin of the hairs in punctures, which are more obvious on the basal joint, remaining joints black, opaque; *labrum* white, with three

black teeth at tip and four marginal punctures, one of which behind each of the lateral teeth, and one at each anterior angle; *mandibles* white at the base, black within and at the tip; *palpi* above green, beneath purple, the second joint of the labiales white.

**TRUNK.** *Thorax* quadrate, inconspicuously narrowed behind, obscure cupreous, with distant hairs, submarginal impressed lines blue; *feet* green; *thighs* usually brassy-red above; *elytra* cupreous brown or blackish obscure, with minute, irregular, green punctures; suture and external edge cupreous, each elytron with an external lunule or curved line, originating on the humerus, sometimes interrupted on the margin and curved inwards towards the tip of the elytron, intermediate band refracted, at the centre of the elytron, in an obtuse angle, curved downwards, and terminating near the suture, posterior band, somewhat lunate, terminal.

**ABDOMEN.** *Tergum* greenish blue, segment brownish or pale at tip; *venter* blue with a purple shade; *tail*, and sinus of the male, purple.

This species I have always been accustomed to refer to *C. trifasciata*, and it is not without considerable hesitation that I venture to give it a distinct name. Mr. Melsheimer considered it as *trifasciata*, and that name in his catalogue refers to the insect under consideration, it is also true, that it corresponds in every particular with the short description of that insect in the *Syst. Nat.* and also in the *Syst. Eleut.*, but this circumstance alone, is not sufficient to warrant us in concluding it to be the same, for in this instance as in very many others wherein brief descriptions are concerned, several distinct species may be referred with equal propriety to the same trivial name. Olivier in his celebrated work, gives us a few additional characters of the *trifasciata*, the most important of which "on voit une raie interrompue, le long de la suture, jusques vers le milieu," is with respect to our insect a

good discriminative character, in which this line or vitta, never has existence; the size also as depicted by him, tab. 2, fig. 18, is not quite half an inch, whereas that of the *vulgaris* is full three-fifths. From these characters it must be evident that Olivier's *trifasciata* is a different insect from the one here described, and as he examined the various cabinets in which the insects described by Fabricius are preserved, I rely upon his knowledge of the Fabrician species, particularly as he gives the synonym of that author. Against the correctness of this decision it might be urged, that Fabricius, in his subsequent work *Syst. Eleut.*, does not refer to the above mentioned figure, neither does he quote Olivier at all under his description of *trifasciata*; but this objection, however plausible, will have no weight, when we know that he refers to this very figure, the 18th, of tab. 2, for the *C. punctulata*, an insect with which it has no other than a generic affinity, and for which on comparison it could not be mistaken.

## 2. CICINDELA \**hirticollis*.

C. obscure cupreous, beneath blueish-green, trunk each side cupreous brilliant, hairy; *elytra* with two lunules, intermediate refracted band, and outer margin, white.

*C. hirticollis*. *Journal of the Academy of Natural Sciences*, vol. I. No. 2, p. 20.

Length rather more than half an inch.

*Inhabits Pennsylvania.*

**DESCR.** **HEAD** cupreous varied with green and blue, front with cinereous hair; terminal joints of the *antennæ* black, opaque; *labrum* white, sinuate on the anterior edge, and furnished with a single tooth and eight submarginal punctures producing hairs; *mandibles* white at the base, within dark green, tip black; *palpi* white, terminal joints green.

**TRUNK.** *Thorax* with the submarginal lines blue, quadrate not straitened behind; *elytra* obscure, punctured irregularly with green, punctures larger than in

the preceding species, more conspicuously serrate at the hind margin and mucronate at the inner tip ; anterior lunule originating on the humerus, continued a short distance on the margin, and curved rather towards the base of the elytron, intermediate band divaricated on the margin, so as to attain the lunules, but is sometimes interrupted before the posterior, refracted in a somewhat acute angle at the centre of the elytron, thence recurved nearly parallel with the suture, and dilated at its termination ; posterior lunule terminal ; *feet* red-cupreous, hairy ; *trochanters* purple.

**ABDOMEN.** *Venter* blue, segments tipped with brassy ; *tail* purple.

This insect does not appear to have been described except in the work to which the synonym refers ; it had been previously overlooked, probably in consequence of its proximity in point of colours and marking to the preceding species, which it generally accompanies ; but a small degree of scrutiny will detect a sufficient number of discriminative characters, to warrant us in constituting of this insect a distinct species ; in size its female is equal to the male of *C. vulgaris*, the punctures of the elytra are much larger, the intermediate band is so widely spread out upon the margin, as nearly to connect the anterior and posterior lunules, and the tip of the anterior lunule is curved towards the base of the elytra and not obliquely towards the tip, as in the preceding species ; a striking difference also is perceptible in the upper lip which in that insect is three-toothed, but in the *C. hirticollis* it is one-toothed. Neither this nor the preceding species have been observed to vary in their colours or markings.

### 3. *CICINDELA unipunctata*.

*C. dull* cupreous, obscure, naked, base of the mandibles ; labrum and marginal dot on each elytron white.

*C. unipunctata*, subpurpurascens, labio elytrorumque puncto albis. *Fab. Syst. Eleut. pars 1, p. 238*.

*C. unipunctata*, violette, brillante en-dessous, obscure en-dessus; elytres avec un point blanc. *Oliv. Inst.* 33, *tab.* 3, *fig.* 27.

Length nearly seven-tenths of an inch.

*Inhabits* the southern states.

**DESCR.** **HEAD** entirely rugose, neck above granulate; *clypeus* narrowed in the middle; *labrum* much broader in the middle, white, edge brown, strongly three-toothed before, of which the intermediate one is larger; margin with four punctures, of which two are at the lateral angles and the others at the base of the lateral teeth; *mandibles* white at base, tip black; *palpi* green.

**TRUNK** reddish-purple on the sides; *thorax* with the lines not deeply impressed or differently coloured, a little narrowed behind; *elytra* with a slight shade of greenish-olive, convex, without a sutural angle or spine behind, irregularly punctured with green; on the posterior half are some larger, scattered, impressed green dots, a few at the base and in an undulated line near the suture; surface somewhat unequal, a conspicuous indentation towards the base of each near the suture and an oblique, abbreviated, obscure one in the centre of the elytron near the marginal spot, which is subtriangular, white and placed on the middle of the margin; a minute, obsolete, white dot is situate at the posterior curve.

**ABDOMEN.** *Venter* reddish-purple each side near the base; *tail* black.

Of this insect I have seen but a single specimen, for which I am indebted to Mr. J. Gilliams, who caught it in the state of Maryland. It is very possible that it may be a distinct species from the *C. unipunctata* as the figure of that insect by Olivier above referred to, is rather smaller and of a somewhat different habit; nevertheless as his description agrees very well

with our insect, I shall consider it as the same until those who have an opportunity of seeing the original may decide.

#### 4. *CICINDELA sexguttata*.

C. greenish-blue polished, each elytron with three marginal white dots, the two first, nearly equal, the last transverse and terminal.

C. 6 *guttata*, viridis, nitida, elytris punctis tribus, maginalibus albis. *Fab. Syst. Eleut.* 1, p. 241.

C. 6 *guttata*, D'un vert bleuâtre brillant; élytres avec trois points blanchâtres, sur le bord extérieur. *Oliv. Ent. No.* 33, pl. 2, fig. 21, a.

C. 6 *guttata*, Elle brille du plus beau verd-bleu. Le pattes sont bleues, les yeux blancs. *Herbst. Arch.* p. 149, pl. 27, fig. 17. Length of the male more than half an inch.

*Inhabits* North America.

**DESCR.** HEAD green, sometimes glossed with blue; *antennæ*, four basal joints green, remainder black-brown; *labrum* white, edged with brown, three triangular teeth before, and six marginal blackish punctures each of which latter furnishes a hair; *mandibles* white above, tip black; *palpi* green; *eyes* brown.

**TRUNK** green, tinged beneath with blue, but without a cupreous tint, hairs remote and short; *feet* green; *trochanters* brassy; *intermediate tibia* with more numerous short hairs near the tip behind; *elytra* green, brilliant, behind the middle blueish-purple, which deepens towards the tip, punctures numerous, sometimes confluent, hind margin rounded, obscurely serrate, sutural margin not abbreviated nor mucronate at tip, each elytron marked by three marginal white dots, the first placed in the middle of the margin, one at the posterior curve, and the third transverse and terminal; inferior page blackish, marginal spots testaceous.

**ABDOMEN.** *Venter* blueish-green, segments margined, bronzed, edge and *tail* purple.

Var.  $\alpha$ . Elytra each with an additional spot, which is fulvous or white, and generally inconspicuous, placed behind the middle triangularly with respect to the two anterior, marginal ones.

Var.  $\beta$ . Each elytron with a single marginal spot, the two posterior ones wanting.

This insect is common in Pennsylvania, but not so frequent as either *vulgaris* or *hirticollis*. Its characters are strong and discriminative, so that our synonyms are free from doubt, although that of Herbst represents the eyes as white; but this colour is, as in some of the Carabi and many other insects, only to be found in the dried specimen, and is by no means universal. The second variety was brought from the banks of the Missouri, above the confluence of the river Platte, by Mr. Thomas Nuttall.

##### 5. CICINDELA \**dorsalis*.

C. bronzed, *elytra* white, each with two curved lines on the disk, suture, and curved branch near the base, green; *tail* testaceous.

C. *dorsalis*. *Journal of the Academy of Natural Sciences*, vol. 1, p. 20.

Length nearly three-fifths of an inch.

*Inhabits* New Jersey.

**DESCR.** **HEAD** bronzed, naked, edges green; *antennæ* brown, basal joints green, the third hairy before; *labrum* white, not emarginate at the anterior angles, broad before, and furnished with a single tooth, eight punctures very near the edge, of which six are equidistant on each side of the tooth, the others remote; *clypeus* almost obsolete above; *mandibles* white above and beneath. tips and teeth within

black-green, a very strong tooth beneath, near the tip of one mandible, the other simply a little angulated in that part; *palpi* white, tip of the terminal joint of each blackish.

**TRUNK**, cupreous, covered each side by short, dense, prostrate, cinereous hair; *thorax* bronzed, varied with green, margin and longitudinal dorsal line, hairy; *scutel* green or bronze; *elytra* white, with very minute, irregular punctures, and a few larger ones on the anterior margin; suture and a lunated branch near the scutel, curving on each elytron and abbreviated behind, the middle of the base green, disk with two abbreviated green bracket-formed lines, of which one curves outwards and the other inwards, respectively terminating at one end opposite the centre of the other.

**ABDOMEN**. *Venter* bronzed, segments margined with purple, having dense, cinereous, prostrate hair each side; *tail* and tip of the last abdominal segments testaceous.

This very fine and beautiful species I discovered a few years ago on the sea beach of New Jersey. In several of the *Cicindelæ* there is a strong tooth on one of the mandibles near the tip, beneath, pointing downwards, which is very conspicuous in the present species; these teeth are I believe never found on both mandibles, otherwise the mouth could not be properly closed, accordingly the tip of the armed jaw is always beneath the other in repose; neither is the weapon confined to the right or left mandible, but is found upon either indifferently, whilst upon the corresponding part of the other, is usually a very small angle. It must be remarked that this insect seems to approach a species described by Fabricius, as a native of the island of St. Thomas, and I here subjoin his definition, "*C. viridi-aenea, elytris albis: sutura lunulaque viridi-aeneis. Syst. Eleut.*"

6. *CICINDELA marginata*.

C. olivaceous, obscure, sometimes with cupreous reflections; *cheeks* sides of the *trunk* and of the *abdomen*, with short dense hair, each elytron with a whiteish margin, two abbreviate branches, an intermediate refracted one, and two dots at base.

C. *marginata*, viridis, elytris punctis quinque, lunulaque apicis albis. *Fabr. Syst. Eleut.* 1, p. 241.

Length of the male more than half an inch.

**DESCR.** HEAD greenish, olivaceous varied with purple, and edged with blue; *antennæ* purple at base, terminal joints brown; *front* with prostrate hair; *labrum* white, with several minute, obtuse teeth, in the male, with a single more prominent one, and about ten marginal punctures, lateral angles rounded; *cheeks* covered with dense hair; *palpi* white, terminal joint of each black at the tip.

**TRUNK** on each side cupreous, concealed by short, cinereous hair; *thorax* bronze or olivaceous, posterior impressed line green or reddish; *elytra* olivaceous-obscure, or tinged with cupreous, margin pale, uniting the anterior and posterior lunules, the former with an accessory spot at the middle of the base, and a smaller one interrupted from its tip, the latter continued a short distance upon the sutural margin, intermediate band refracted in a very acute angle, at the centre of the elytron elongated, and dilated behind, terminating at the suture, in a transverse line drawn from the tip of the posterior lunule; *trochanters* testaceous.

**ABDOMEN.** *Venter* very hairy each side, segments bronzed and margined with purple; *tail* testaceous, of the female blackish-purple.

The markings of the elytra are in many specimens so far obsolete, as to be only distinguishable in a particular light ; and they are always less obvious, than those of *vulgaris*, *hirticollis*, &c. to the latter of which, this insect, in the distribution of its bands and lunules, bears some resemblance.

#### 7. *CICINDELA obscura*.

C. black, each elytron with two white marginal spots and a terminal lunule.

C. *obscura*, nigra, elytris punctis duobus marginalibus, lunulaque apicis, alba. *Fabr. Syst. Eleut. pars 1, p. 238.*

Length nearly half an inch.

*Inhabits* North America.

**DESCR.** HEAD black, naked ; *antennæ* brown at tip ; *clypeus* large ; *labrum* white, three-toothed, not emarginate at the anterior angles, margin with about six punctures, of which one is placed each side of the larger, central tooth ; *mandibles* white on the exterior base above ; *palpi* piceous.

**TRUNK** black, immaculate ; *elytra* tinged with brown on the posterior half, punctures minute, not deeply impressed, two white marginal maculæ, of which the anterior one is smaller, rounded, and placed near the humerus, the other large, triangular, situate in the middle of the margin, lunule terminal ; *tarsi* piceous.

**ABDOMEN** black, naked, immaculate.

Var. *α*. *Labrum* black or piceous, anterior marginal spot of the elytra wanting.

Very distinct from any other species with which I am acquainted, for the variety I am indebted to Mr. J. Gilliams, who caught it in the state of Maryland.

8. *CICINDELA purpurea*.

C. head, impressed lines of the thorax, and margin of the elytra, green, the latter with a central, reclivate, oblique, abbreviated band, terminal line and intermediate dot, white.

C. *purpurea*, purpurine en-dessus, d'un vert bleuâtre en-dessous ; élytres avec une band courte, et deux points blancs. *Olivier's Inst.* 33, t. 3, fig. 34.

C. *marginalis*? thorace elytrisque cupreis ; marginibus viridibus, elytris lunulis duabus albis. *Fabr. Syst. Eleut.* 1, p. 240. Length of the male about three-fifths of an inch.

*Inhabits* North America.

DESCR. HEAD red-cupreous, hairy with green edges, and two distinct green lines between the eyes, originating at the base of the antennæ, and approximating towards the vertex ; *antennæ* green at base, tip brown ; *clypeus* blue ; *labrum* white, three-toothed, edge black and with about eight marginal punctures ; *mandibles* black within and at tip ; *palpi* green.

TRUNK green, each side golden ; *thorax* with a cupreous disk ; *elytra* olivaceous-green to a brilliant cupreous-red, margin bright green, each with an oblique, reclivate band near the middle, originating at the green margin, and terminating at a distance from the suture, a transverse line at tip and an intermediate submarginal dot, white ; *trochanters* purple ; *tibia* hirsute behind.

ABDOMEN. *Venter* green, sides purple.

Var. *a*. Elytra destitute of the intermediate dots. C. *ramosa*. *Melsheimer's Catalogue*, p. 46.

Var. *β*. Head and thorax green ; elytra as in the preceding variety.

Var. *γ*. Head and thorax green ; elytra immaculate.

Var. ♂. Black, opaque above, beneath polished; labrum, lines and spot of the elytra, as in the species; cheeks and venter a little glossed with purple.

*C. tristis?* nigra, elytris macula media flava. *Fabr. Syst. Eleut.* 1, p. 235. (Var.)

This insect is subject to numerous varieties in colour and markings, but those above described are the most striking of any that have fallen under my observation; the anterior band is sometimes obsolete towards the tip, so as to leave a very short perfectly transverse line attached to the margin. The variety *a*, is much more common in Pennsylvania than either of the others. It is probable that the *marginalis* of Fabricius will prove to be the same with this, but Olivier's designation, having the right of priority, will of course be adopted. The variety ♂, is a memorable departure from the appearance of the species, no trace of the original colouring remains upon it, but that of the bands, &c. of the elytra, it seems a link in the connecting chain which unites the *purpurea* with the species described by Fabricius, under the trivial name *tristis*, and seems to be alienated from it, only by the presence of an intermediate dot and terminal line, the central reclivate band is precisely the same in form. Nevertheless it is highly probable that the *tristis* is a distinct species, although for the present I have placed it here as a variety, having no opportunity of examining a specimen.

### 9. *CICINDELA punctulata*.

*C.* obscure cupreous, beneath varied with blue and purple, each elytron with a few white points and terminal lunule, an undulated line of distant green punctures near the suture.

*C. punctulata*. Bronzée en-dessus, blue en-dessous; elytres avec quelques points blancs, et une suite de pointes enfoncées brillants. *Oliv. Inst. No.* 33, *tab.* 3, *fig.* 37, *a. b.*

*C. punctulata*, capite thoraceque cupreis, elytris punctatis obscuris: punctis lunulaque apicis albis. *Fabr. Syst. Eleut. pars 1, p. 241.*

*C. obscura.* *Melsheimer's Catalogue.*

Length about half an inch.

*Inhabits* North America.

**DESCR.** HEAD cupreous obscure, margin cheeks and two lines between the eyes blue; *antennæ* brown, base cupreous; *front* naked; *labrum* white, sinuated on the edge, with a single prominent tooth and six submarginal punctures; *palpi*, labials white, last joint green, external maxillary ones piceous, third and fourth joints green.

TRUNK deep blue, varied with purple beneath, sides cupreous; *thorax* colour of the head, impressed lines and lateral margin blue; *elytra* colour of the thorax, irregularly punctured with green, on each an undulated line of distant larger green punctures near the suture, and a few at the middle of the base; five small white dots, of which three are on the disk arranged in an oblique line, one near the humerus, the second central, third near the suture, the fourth and fifth dots marginal situate opposite the two preceding ones, terminal lunule straight, not ascending the suture.

**ABDOMEN.** *Venter* varied with purple and blue; *tail* bronzed.

**Var. a.** Elytra destitute of the white dots, the lunule only remaining.

A very common insect, its variations are confined to changes in the number and magnitude of the spots of the elytra; the anterior marginal dot is always minute, and of all the others most frequently wanting, the two anterior spots of the disk also, are often invisible. Fabricius by mistake refers to fig. 18, tab.

2. of Olivier's Insects, for this species, which is intended for the *C. trifasciata*, a native of South America, rather smaller than this insect and totally distinct in its characters.

10. *CICINDELA* \**formosa*.

*C.* red-cupreous brilliant ; elytra with a three-branched, broad white margin.

*C. formosa*. *American Entomology*, pl. 6.

———— *Journal of the Acad. of Nat. Sciences*, p. 19.

Length seven-tenths, breadth one-fourth of an inch.

*Inhabits* the sandy alluvions of the Missouri, above the confluence of the river Platte.

**DESCR.** **HEAD** red-cupreous, brilliant ; *front* hairy ; *antennæ* fuscous, basal joint green, second bronzed, third and fourth purple ; *clypeus* and *cheeks* deep purple, the latter hairy ; *labrum* white, with a blackish three-toothed edge, and six marginal punctures ; *mandibles* black, base above white ; *palpi*, basal joints testaceous or pale, terminal one green tipped with bronze.

**TRUNK** deep purple, sides green, hairy ; *thorax* colour of the head, scabrous ; *pectus* green before ; *feet* purple ; *coxæ* hairy ; *trochanters* bronzed ; *elytra* colour of the head and thorax, with a dilated, white, uninterrupted margin, and blueish edge, anterior and posterior branches, short, intermediate band flexuous and oblique, nearly attaining the suture, and with the other branches dilated, equal to the margin ; hind angle not conspicuously mucronate.

**ABDOMEN.** *Venter* exclusively purple, covered with cinereous hair ; *tail* bronzed.

The most beautiful, and one of the largest of the North American species ; in the arrangement of the bands, &c.

of the elytra, it has some resemblance to the *C. hirticollis*, but is a perfectly distinct species.

11. *CICINDELA* \**decemnotata*.

C. green, above tinged with cupreous ; elytra margined with bright green or blueish, four white spots and an intermediate refracted band.

C. 10 *notata*. *American Entomology*, pl. 6.

————— *Journal Acad. Nat. Sciences*, p. 19.

Length three-fifths of an inch, nearly.

*Inhabits* with the preceding.

DESCR. HEAD green, varied with cupreous and blue ; *front* hairy ; *labrum* white, unequal, edge black, and tridentate ; *antennæ* fuscus, basal joints variegated ; *palpi* dark purple, varied with green.

TRUNK green, a little bronzed each side ; *thorax* blueish, the bilobate disk cupreous ; *scutel* blue ; *elytra* dull olivaceous-green, with a slightly cupreous tint, and blue margin, four white dots and refracted band ; of the anterior marginal dots, one is placed on the humerus, and the second equidistant from the band, which is refracted at the centre of the elytron, and terminated near the suture, in a transverse line with the penultimate spot, this last is large, submarginal, and orbicular, terminal spot transversely triangular, and with the first interrupting the margin ; sutural angle not mucronate.

ABDOMEN. *Venter* blueish-green, with a few hairs each side ; *tail* purple.

The specimen from which this description was taken is a female, it resembles *C. purpurea* in its differently coloured elytral margin, but is sufficiently distinct from that insect by its more numerous spots, &c.

12. *CICINDELA \*pusilla*.

C. body above blackish obscure, beneath black-blue, or greenish ; *trochanters* testaceous ; *elytra* with two lunules, and intermediate band, which is divaricated on the margin.

*C. pusilla*. *Journ. Acad. Nat. Sciences*, p. 21.

Length less than half an inch.

*Inhabits* with the preceding.

DESCR. HEAD dark green, obscure ; *antennæ* fuscous, bronzed-testaceous, or greenish at base ; *labrum* white sinuate, and brown on the edge, with six or eight marginal punctures ; *palpi* testaceous, bronzed at tip ; *front* naked.

TRUNK obscure ; *thorax* with the impressed lines not differently coloured ; *elytra* black, each with two lunules and a recurved band, attenuated, anterior lunule elongated, much narrowed, acute at tip, posterior one, not dilated at the suture, and incurved from the margin ; band dilated near the margin into a triangle, recurved before the middle, and passing very obliquely and nearly in a right line, to its termination near the suture, sometimes obsolete at tip ; *feet* testaceous, thighs dark green.

ABDOMEN. *Venter* dark blue, segments tipped with bronze, almost naked each side ; *tail* purple.

Var. *a*. *Elytra* destitute of the intermediate band.

This is the smallest of our species, being less than *punctulata*, and of the most sombre colouring ; the lunules and band hardly relieve, by a contrast with the general surface, as they are very narrow.

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The preceding descriptions were drawn out from specimens in my possession, the three last species, were caught by

by Mr. Thomas Nuttall on the Missouri, and now form a part of his collection; to him I am indebted for the permission to describe them. Specimens of those for which I have referred to Melsheimer's Catalogue, were sent me by the Rev. John Melsheimer of Hanover, a zealous entomologist and son of the author of that work, who may justly be entitled the father of entomology in this country.

In order that the present paper may comprehend all the known North American species of this genus, and thereby present a complete Monograph, I subjoin from Fabricius, three descriptions of species, which have not fallen under my notice, I therefore have taken the liberty to translate his descriptions as follow :

13. *CICINDELA violacea*.

C. bright blue polished; *labrum* white.

*Inhabits* Carolina.

Cabinet of Mr. Bosc.

DESCR. Of a medium size; *body* bright blue, polished, covered with elevated, scabrous punctures; *antennæ* dark brown at tip; *labium* (*labrum*) and base of the mandibles above, white. *Syst. Eleut. part 1, p. 232.*

(Is not this referable to the genus *Megacephala*?)

14. *CICINDELA abdominalis*.

C. black, *labrum* and lunule at the apex of the elytra, white; *abdomen* rufous.

*Inhabits* Carolina.

Cabinet of Mr. Bosc.

DESCR. Smaller than C. *germanica*; *head* and *thorax* cylindrical, black-cupreous, a little polished; *labrum*

white; *elytra* black; an obscure line of impressed punctures at the suture, and white lunule at tip; *body* and *feet* greenish-brassy, polished; *abdomen* ferruginous. *Syst. Eleut. part 1. p. 237.*

15. *CICINDELA micans.*

*C. Head* and *thorax* cupreous, polished; *elytra* obscure; minute points and lunule at the apex, white.

*Inhabits* North America. *Syst. Eleut. part 1, p. 238.*

It is highly probable that this description was intended to designate an insect very similar to the *C. punctulata*, perhaps the same, or only a variety of it, for it is as characteristic of that species as it can be of any other.

